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(54) Title: PHOTOVOLTAIC CELL COMPONENTS AND MATERIALS

(57) Abstract: A polymeric linking agent enables the manufacture of photovoltaic cells at low temperatures (< about 300 °C) on flexible substrates, including, for example, polymeric substrates. Photovoltaic cells may be fabricated by a relatively simple continuous manufacturing process, for example, a roll-to-roll process, instead of a batch process. Processes and compositions that cause the gelling of liquid electrolytes at relatively low temperatures also facilitate the fabrication of flexible photovoltaic cells. Methods and chemical structures that improve the adhesion of a photovoltaic material to the substrates and that produce mechanically stable nanoparticle formulations are also described. Furtehrmore, co-sensitizers that co-adsorb with a sensitizing dye to the surface of an interconnected semiconductor oxide nanoparticle material increase the efficiency of photovoltaic cells by improving their charge transfer efficiency and reducing the back transfer of electrons from the interconnected semiconductor oxide nanoparticle material to the sensitizing dye.